What is claimed is:

1. A method of producing semiconductor devices, comprising the steps of:

forming an etching resistive mask over a semiconductor substrate;

etching said semiconductor substrate through an opening in said etching resistive mask to form a device isolation trench;

forming a coat of a silazane perhydride polymer solution over said semiconductor substrate having said device isolation trench formed therein;

vaporizing a solvent from said coat and then subjecting said coat to chemical reaction to form a film of silicon oxide;

removing said film of the silicon oxide leaving a residue inside said device isolation trench; and

heating said silicon oxide left in said device isolation trench for densification.

2. The method according to claim 1, wherein said etching resistive mask is formed so as to contain a film of silicon nitride, further comprising the step of:

forming a film of silicon oxide over the surface of said silicon nitride after formation of said device isolation trench and before forming said coat of said silazane perhydride polymer solution.

3. The method according to claim 1, wherein said etching resistive mask is formed so as to contain a film of silicon nitride, further comprising the step of:

forming a film of silicon oxide over the surface of said silicon nitride after formation of said device isolation trench, before forming said coat of said silazane perhydride polymer solution and after etching said silicon nitride to etch back opening edges.

4. The method according to claim 2 or 3, wherein said step of forming said silicon oxide over the surface of said silicon nitride includes either one of radical oxidation, low pressure CVD and plasma CVD.